

## A Checklist of Metazoan Parasites of Cichlid Fish from Mexico

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**ABSTRACT:** Based on previously published records and original data, a checklist of the metazoan parasite fauna reported in 26 species of native cichlids from Mexico is presented. The checklist contains 90 metazoan parasite species, including 5 species of monogeneans, 19 adult trematodes, 27 metacercariae, 1 adult cestode, 3 larval cestodes, 5 adult acanthocephalans, 2 cystacanths, 10 adult nematodes, 13 larval nematodes, 2 leeches, 2 pentastomids, and 1 molluscan larva. It includes 140 new host parasite records for Mexico and records 13 species for the first time.

**KEY WORDS:** *Cichlasoma* spp., *Petenia splendida*, helminths, pentastomids, leeches, molluscs.

At present, there is no checklist of metazoan parasites (Platyhelminthes, Acanthocephala, Nematoda, Annelida, Hirudinea, Mollusca, Bivalvia, Arthropoda, and Pentastomida) of Mexican fish. Literature on the parasite fauna of cichlids is mainly scattered in taxonomic papers (Caballero-Rodríguez, 1982; Lamothe-Argumedo and Jaimez-Cruz, 1982a, b; Meave-Gallegos, 1982; Salgado-Maldonado, 1982). A few regional surveys, e.g., that of Pineda-López et al. (1985), include compiled lists of macroparasites from hydrological systems for a limited number of host species. Notwithstanding, some studies (Pineda-López, 1985a, Osorio-Sarabia et al., 1987) paid particular attention to Cichlidae, since this is one of the most speciose, common, and widely distributed families among the Mexican ichthyofauna. According to Miller (1966), Miller and Smith (1986), and Conkel (1993), this family includes approximately 67 species in Mexico, but only 26 of these have been investigated for parasites. Recently, as a consequence of increasing interest in the native cichlids for aquaculture (Martínez-Palacios et al., 1993; Martínez-Palacios and Ross, 1994), there has been a growing interest in their parasitic fauna (Salgado-Maldonado, 1993; Pineda-López, 1994; Vidal-Martínez, 1995).

The objective of this paper is to compile the extant information on the macroparasites of na-

tive cichlid fishes from Mexico, published in regional or local scientific journals with a limited distribution, and to include original data derived from our own research. It is expected that this checklist will facilitate future research on ecology, zoogeography, and biodiversity, but it is also directed to researchers working in aquaculture projects.

The checklist is organized in a parasite–host list, including host/locality records, arranged following a phylogenetic order: Trematoda, Monogenea, Cestoda, Acanthocephala, Nematoda, Annelida, Mollusca, and Arthropoda. Within each phylum or class, families are listed in the order followed by these authorities: Yamaguti (1971) for trematodes; Boeger and Kritsky (1993) for monogeneans; Khalil et al. (1994) for cestodes; Amin (1985) for acanthocephalans; and Anderson et al. (1974–1983), Anderson (1992), and Moravec (1994) for nematodes. Genera and species are listed in alphabetical order. This list also shows for each parasite species: the current scientific name followed by the author(s) and date(s), the site(s) of infection, and the host(s)/locality(ies) in which the parasite species was recovered. A list of the features and codes for each locality is shown in Table 1. Published records are presented first; unpublished data from our own records are indicated by an asterisk (\*) and new localities by a double asterisk (\*\*). No attempt was made to evaluate taxonomic validity of previously published rec-

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**Table 1. Codes and features of the localities sampled or reported in the literature from which cichlids were collected.**

CODE	Name of the locality	Type*	State
ANG	Angostura	D-f	Chiapas
ATA	Atasta	E-b	Campeche
BAL	Balancán	R-f	Tabasco
BOX	Box-Toro	C-f	Yucatán
CAB	Cabañas	C-f	Quintana Roo
CAM	Santiago	E-b	Campeche
CAT	Catemaco	L-f	Veracruz
CAY	Cayo	L-b	Campeche
CEA	Cenote Azul (Bacalar)	C-f	Quintana Roo
CEL	Celestún	E-b	Yucatán
CEN	Cenote Azul (Puerto Aventuras)	C-f	Quintana Roo
COR	El Corozal	R-f	Tabasco
CUA	Los Cuates	C-f	Yucatán
CUC	Cuatro Ciénegas	L-f	Coahuila
CHA	Champotón	E-b	Campeche
CHE	Chen-há	C-f	Yucatán
CHI	Chiribital	L-f	Tabasco
CHK	Chek-há	C-f	Yucatán
CHL	Chelem	E-b	Yucatán
CHN	Chicoasén	D-f	Chiapas
CHO	Camellones Chontales	R-f	Tabasco
DZA	Dzaptún	C-f	Yucatán
DZI	Dzibilchaltún	C-f	Yucatán
DZO	Dzonot Cervera	C-f	Yucatán
EMZ	Emiliano Zapata	L-f	Tabasco
ESP	El Espino	R-f	Tabasco
FRA	Framboyán	C-f	Yucatán
GRA	Gran Cenote	C-f	Yucatán
GER	Santa Gertrudis	L-b	Campeche
GUA	El Guanal	L-f	Tabasco
GUE	Laguna Guerrero	L-f	Quintana Roo
HOD	Hodz-Ob	C-f	Yucatán
HON	Río Hondo	R-f	Quintana Roo
HOR	Laguna El Horizonte	L-f	Tabasco
HUN	Hunucmá	C-f	Yucatán
ILU	Laguna Ilusiones	L-f	Tabasco
INF	Presa El Infiernillo	D-f	Michoacán
JON	Jonuta	R-f	Tabasco
LAG	Río Lagartos	C-f	Yucatán
LPA	Puerta	R-f	Chiapas
MAL	Presa de Malpaso	D-f	Chiapas
MIT	Mitza	C-f	Yucatán
NOB	Noh Bek	L-f	Quintana Roo
NOC	Noc-Chonunchey	C-f	Yucatán
PAL	Palizada	L-b	Campeche
PAR	Estero Pargos	E-b	Campeche
PRG	Presa Rodrigo Gómez	D-f	Nuevo León
PUE	Puerto Morelos (spring near to)	R-f	Quintana Roo
RIO	Río de los Pescados	R-f	Veracruz
ROS	El Rosario	L-f	Tabasco
SAE	Santa Elena	C-f	Yucatán
SAN	Santa Anita	L-f	Tabasco
SIL	Silvituc	L-f	Campeche
SPE	Río San Pedro	R-f	Tabasco
TEA	Teapa	P-f	Tabasco
TEM	Presa Temazcal	D-f	Oaxaca

**Table 1. Continued.**

CODE	Name of the locality	Type*	State
TEN	Tenosique	R-f	Tabasco
TLA	Tlacotalpan	L-f	Veracruz
TUC	Tucta	P-f	Tabasco
USU	Río Usumacinta	R-f	Tabasco
VAP	Laguna El Vapor	L-f	Campeche
VIG	Vicente Guerrero	R-f	Tabasco
XOL	Xtoloc	C-f	Yucatán
XPO	Xpoc	C-f	Yucatán
YUC	Unspecified	—	Yucatán
ZAC	Zaci	C-f	Yucatán

\* C, other bodies of water ("sinkholes" = cenotes; gravel pits); D, dam; E, estuary; L, coastal lagoons; Lf, inner lake; P, ponds for aquaculture; R, river; b, brackish water; f, fresh-water.

ords. However, new name combinations and known misidentifications of the metazoan parasites are noted when necessary. The scientific names of the fish are those recommended by Miller (1966, 1986) and Miller and Smith (1986).

#### Comments

This checklist includes a total of 90 species, some of which were determined only to family or genus level because of the poor condition of the preserved specimens or the developmental stage of the specimens (larvae). This checklist includes 433 new locality and 140 new host records. There are 47 species of native cichlid fish in southern México (Grijalva—Usumacinta basin and the Yucatan Peninsula provinces of Miller, 1966), and most of the records of their parasites come from this area. The helminth record in Mexican cichlids presented herein concerns only 26 of these cichlid species. The list therefore is still incomplete. Cichlid species are widely distributed in Central America and even reach the Caribbean Islands; however, data on their helminths are scarce.

#### Parasite-Host List

##### Monogenea

##### Family Dactylogyridae Bychowsky, 1933

1. *Sciadicleithrum bravohollisae* Kritsky, Vidal-Martínez, and Rodríguez-Canul, 1994. Gills of *Cichlasoma pearsei* (VAP), *C. synspilum* (ATA, VAP), *Petenia splendida* (VAP) (Kritsky et al., 1994); *C. synspilum* (SIL\*\*).

2. *Sciadicleithrum mexicanum* Kritsky, Vidal-Martínez, and Rodríguez-Canul, 1994. Gills of *C. urophthalmus* (ATA, CHA, CHL, LAG, SIL) (Kritsky et al., 1994); *C. urophthalmus* (MIT) (Mendoza-Franco et al., 1995); *C. urophthalmus* (SAE\*\*, VAP\*\*).

3. *Sciadicleithrum splendidae* Kritsky, Vidal-Martínez, and Rodríguez-Canul, 1994. Gills of

*P. splendida* (VAP) (Kritsky et al., 1994); *C. synspilum*\*, *P. splendida* (SIL\*\*).

4. *Sciadicleithrum* sp. Gills of *C. geddesi* (SAN), *C. pearsei* (EMZ), *C. synspilum* (JON, SAN) (Pineda-López et al., 1985); *C. synspilum* (JON, TUC\*\*), *C. urophthalmus*\* (TUC\*\*). Remarks: Reported as "Dactylogyridae" by Pineda-López et al. (1985).

5. Dactylogyridae gen. sp. Gills of *Cichlasoma* spp. (CUC) (Guajardo-Martínez, 1984).

#### Adult Trematoda

##### Family Haploporidae Nicoll, 1914

6. *Saccocoelioides beauforti* (Hunter and Thomas, 1961). Intestine of *C. managuense*\* (GUA\*\*), *C. synspilum*\* (ILU\*\*, SAN\*\*), *C. urophthalmus*\* (GUA\*\*, HOR\*\*), *P. splendida*\* (TUC\*\*).

7. *Saccocoelioides* sp. Intestine of *Cichlasoma* spp. (CUC) (Guajardo-Martínez 1984); *C. synspilum* (CEA) (Scholz et al., 1995b).

##### Family Angiodictyidae Looss, 1902

8. *Cichlasotrema ujati* Pineda-López and Andrade-Salas, 1989. Intestine, mainly rectum of *C. fenestratum* (ROS), *C. helleri* (ROS), *C. pearsei* (EMZ), *C. rectangulare* (EMZ), *C. synspilum* (JON) (Pineda-López et al., 1985); *C. synspilum* (ROS) (Fucugauchi et al., 1988); *C. synspilum* (SAN) (Pineda-López and Andrade-Salas, 1989); *C. synspilum* (CEA) (Scholz et al., 1995b); *C. geddesi*\* (VAP\*\*), *C. helleri* (ILU\*\*, VAP\*\*), *C. pearsei* (VAP\*\*), *C. synspilum* (ILU\*\*, VAP\*\*), *P. splendida*\* (SAN\*\*). Remarks: Previously reported as *Oc-tangioides* sp. (Pineda-López et al., 1985).

##### Family Gorgoderidae (Looss, 1899)

9. *Phyllodistomum lacustris* (Loewen, 1929). Urinary bladder and intestine of *C. geddesi*\* (VAP\*\*), *C. synspilum*\* (SAN\*\*, VAP\*\*), *C. urophthalmus*\* (VAP\*\*, HOR\*\*).

##### Family Zoogonidae Odhner, 1911

10. *Diphtherostomum brusinae* (Stossich, 1888). Intestine of *C. urophthalmus*\* (CAY\*\*).

##### Family Callodistomidae Poche, 1926

11. *Prosthenhystra obesa* (Diesing, 1850). Gallbladder of *C. helleri* (ROS), *P. splendida* (ROS) (Fucugauchi et al., 1988); *P. splendida* (TUC\*\*).

##### Family Acanthocolpidae Lühe, 1909

12. *Stephanostomum* sp. Intestine of *C. urophthalmus*\* (CAY\*\*).

##### Family Homalometridae (Cable and Hunninen, 1942)

13. *Crassicutis bravoae* Jiménez and Caballero y Caballero, 1974. Intestine of *C. cyanoguttatus* (PRG) (Jiménez and Caballero y Caballero, 1974); *Cichlasoma* spp. (CUC) (Guajardo-Martínez, 1984).

14. *Crassicutis cichlasomae* Manter, 1936. Intestine of *C. mayorum* (XOL) (Manter, 1936; Pearse, 1936); *C. bifasciatum* (SPE), *C. managuense* (JON), *C. pearsei* (EMZ), *C. synspilum* (JON, SAN, SPE), *C. urophthalmus* (JON, SAN), *Cichlasoma* sp. (SPE), *P. splendida* (SPE) (Pineda-López et al., 1985); *C. hartwegi* (MAL), *P. splendida* (ANG) (Pineda-López, 1985a); *C. urophthalmus* (HOR) (Osorio-Sarabia et al., 1987); *C. gadovii* (CAT) (Ponciano-Rodríguez, 1986); *C. fenestratum* (ROS), *C. geddesi* (ROS), *C. helleri* (ROS) (Fucugauchi et al., 1988); *C. fenestratum* (CAT) (Jiménez-García, 1993); *C. meeki*, *C. urophthalmus* (MIT) (plus "several cenotes around Mérida, Yucatán Peninsula") (Scholz, et al., 1995a); *C. meeki* (CHK, NOC), *C. octofasciatum* (DZO), *C. pearsei* (NOC), *C. synspilum* (CEA), *C. urophthalmus* (CHE, DZA, DZI, DZO, GRA, NOC, ZAC), (Scholz et al., 1995b); *Cichlasoma* sp. (PUE), (Lamothe-Argumedo et al., 1991, *C. friedrichstahli*\* (TUC\*\*), *C. geddesi*\* (TUC\*\*, VAP\*\*), *C. helleri* (HOR\*\*, ILU\*\*, TUC\*\*, VAP\*\*), *C. managuense* (GUA\*\*, VAP\*\*), *C. pasionis*\* (ILU\*\*, TUC\*\*), *C. pearsei* (VAP\*\*), *C. robertsoni*\* (CAM\*\*), *C. synspilum* (ILU\*\*, ROS, TUC\*\*, VAP\*\*), *C. urophthalmus* (ATA\*\*, CAM\*\*, CEL\*\*, CHA\*\*, CHL\*\*, GER\*\*, GUA\*\*, GUE\*\*, HOR\*\*, LAG\*\*, NOB\*\*, PAL\*\*, SAE\*\*, VAP\*\*), *P. splendida* (VAP\*\*).

15. *Crassicutis opisthoseminis* Bravo-Hollis and Arroyo, 1962. Intestine of *C. motaguense* (JON) (Pineda-López et al., 1985).

16. *Homalometron pallidum* Stafford, 1905. Intestine of *C. rectangulare* (EMZ), (Pineda-López et al., 1985); *C. geddesi*\* (VAP\*\*), *C. helleri*\* (HOR\*\*, VAP\*\*), *C. pearsei*\* (VAP\*\*), *C. synspilum*\* (SAN\*\*, VAP\*\*), *C. urophthalmus*\* (GER\*\*, HOR\*\*, MIT\*\*, VAP\*\*), *P. splendida*\* (TUC\*\*, VAP\*\*). Re-

marks: *Crassicutis* sp. 2 of Pineda-López et al. (1985) is *H. pallidum*.

#### Family Opecoelidae Ozaki, 1925

17. *Helicometrina nimia* Linton, 1910. Intestine of *C. urophthalmus*\* (CAY\*\*).

#### Family Cryptogonimidae Ward, 1917

18. *Palaeocryptogonimus* sp. Intestine of *C. helleri*\* (ROS\*\*). Remarks: Cryptogonimidae A of Fucugauchi et al. (1988) is *Paleocryptogonimus* sp.

19. *Oligogonotylus manteri* Watson, 1976. Intestine, rectum of *C. urophthalmus* (JON, SAN) (Pineda-López et al., 1985); *C. urophthalmus* (MAL) (Pineda-López, 1985a); *C. urophthalmus* (HOR) (Osorio-Sarabia et al., 1987); *C. synspilum* (ROS) (Fucugauchi et al., 1988); *Cichlasoma* sp. (PUE) (Lamothe-Argumedo et al., 1991); *C. urophthalmus* (CEL, CHA, GUE, LAG, MIT, NOB, PAR, VAP) (Scholz et al., 1994); *C. friedrichstahli* (CEN), *C. meeki* (CAB, CEA), *C. synspilum* (CAB, CEA), *C. urophthalmus* (CAB, DZO, GRA) (Scholz et al. 1995b); *C. geddesi*\* (VAP\*\*), *C. helleri*\* (ILU\*\*), *C. managuense*\* (VAP\*\*, GUA\*\*), *C. synspilum* (ATA\*\*, SAN, ILU\*\*), *C. urophthalmus* (ATA\*\*, CAM\*\*, CEL, CHA, CHL\*\*, GER\*\*, GUA\*\*, GUE, HOR, LAG, MIT, NOB, PAL\*\*, PAR, TUC\*\*, VAP).

20. *Tabascotrema verai* Lamothe-Argumedo and Pineda-López, 1989. Intestine of *P. splendida* (ROS) (Fucugauchi et al., 1988); *P. splendida* (SPE, SAN, JON, VAP, TUC) (Lamothe-Argumedo and Pineda-López, 1989).

21. *Pseudocaecincola batallae* Lamothe-Argumedo, Salgado-Maldonado, and Pineda-López, 1991. Intestine of *P. splendida* (VAP) (Lamothe-Argumedo et al., 1991).

22. *Campechetrema herrerae* Lamothe-Argumedo, Salgado-Maldonado, and Pineda-López (1997). Intestine of *P. splendida* (VAP), Lamothe-Argumedo et al., 1997.

#### Family Derogenidae Lühe, 1910

23. *Genarchella isabellae* (Lamothe-Argumedo, 1977). Stomach, sometimes intestine of *C. cyanoguttatum*, *Cichlasoma* spp. (CUC) (Jiménez et al., 1981); *C. synspilum* (ROS), *C. urophthalmus* (ROS) (Fucugauchi et al., 1988); *C. fenestratum* (CAT) (Jiménez-García, 1993); *C. urophthalmus* (CHA, USU) (Scholz and Salgado-Maldonado, 1994); *C. friedrichstahli* (CEA),

*C. meeki* (CAB, CEA), *C. octofasciatum* (CAB), *C. pearsei* (NOC), *C. synspilum* (CAB), *C. urophthalmus* (CAB, DZO) (Scholz et al., 1995b); *C. friedrichstahli* (TUC\*\*), *C. geddesi*\* (VAP\*\*), *C. helleri*\* (HOR\*\*, ILU\*\*, VAP\*\*), *C. managuense*\* (GUA\*\*, VAP\*\*), *C. pearsei*\* (VAP\*\*), *C. synspilum* (VAP\*\*), *C. urophthalmus* (GUA\*\*, HOR\*\*, MIT\*\*, TUC\*\*, VAP), *P. splendida*\* (SAN\*\*). Remarks: *Quadripaludis luistoddi* of Jiménez et al. (1981) and of Guajardo-Martínez (1984) is *G. isabellae* (Scholz and Salgado-Maldonado, 1994).

#### Family Hemiuridae Lühe, 1901

24. *Lecithochirium floridense* (Manter, 1934). Intestine of *C. urophthalmus*\* (CAY\*\*, CEL\*\*, PAR\*\*).

#### Larval Trematoda, Metacercariae

##### Family Microphallidae (Ward, 1901)

25. *Maritreminoides* sp. From *Cichlasoma* spp. (CUC) (Guajardo-Martínez, 1984).

##### Family Acanthostomidae Poche, 1926

26. *Pelaezia loossi* (Perez-Vigueras, 1957). Scales of lateral line, muscles, fins, and eyes of *C. urophthalmus* (CEL, CHA, LAG, NOB, VAP) (Salgado-Maldonado and Aguirre-Macedo, 1991; Aguirre-Macedo and García-Magaña, 1994); *C. meeki* (NOC, CHK), *C. octofasciatum* (BOX) (Scholz et al., 1995c).

27. *Atrophecaecum* (?) *astorquii* (Watson, 1976). Fins (mainly pelvic), occasionally gills, scales, eyes, and swimbladder of *C. meeki* (CHE, HUN, NOC), *C. octofasciatum* (BOX), *C. pearsei* (NOC), *C. synspilum* (CAB), *C. urophthalmus* (CAB, CHE, DZA, DZO, GRA, NOC), *P. splendida* (NOC) (Scholz et al., 1995c).

28. Acanthostomidae gen. sp. Fins and muscles of *C. geddesi*\* (VAP\*\*), *C. helleri*\* (VAP\*\*), *C. pearsei*\* (VAP\*\*), *C. urophthalmus*\* (CEL\*\*, CHA\*\*, LAG\*\*, NOB\*\*, VAP\*\*); *P. splendida*\* (VAP\*\*).

##### Family Opisthorchiidae Braun, 1901

29. *Cladocystis trifolium* (Braun, 1901). Gills and operculum of *C. synspilum* (JON), *Cichlasoma* sp. (SPE) (Pineda-López, 1985b); *C. fenestratum* (ROS), *C. helleri* (ROS), *C. synspilum* (ROS) (Fucugauchi et al., 1988); *C. fenestratum* (CAT) (Jiménez-García, 1993); *C. meeki* (NOC) (Scholz et al., 1995c); *C. synspilum*

(CHO, HOR, TEN, VAP); *C. urophthalmus* (VAP) (Aguirre-Macedo and García-Magaña, 1994); *C. geddesi*\* (VAP\*\*), *C. pearsei*\* (VAP\*\*), *C. synspilum* (CHA\*\*, TUC\*\*), *P. splendida*\* (VAP\*\*). Remarks: Acanthostomidae metacercariae of Pineda-López (1985b) were determined as *Cladocystis trifolium* in Pineda-López et al. (1985).

30. *Perezitrema bychowskyi* (Caballero y Caballero, 1974). Gills, fins, mesenteries, liver, spleen, heart, swimbladder, and intestinal wall of *C. bifasciatum* (SPE), *C. managuense* (JON), *C. synspilum* (JON) (Pineda-López (1985b); *C. geddesi* (TEN), *C. helleri* (TEA, VAP), *C. synspilum* (CHO, ESP), *C. urophthalmus* (CHO, ESP), *Cichlasoma* sp. (TEN) (Aguirre-Macedo and García-Magaña, 1994); *C. geddesi* (VAP\*\*), *C. managuense* (SIL\*\*, VAP\*\*), *C. pearsei*\* (VAP\*\*), *C. synspilum* (VAP\*\*), *C. urophthalmus* (GER\*\*, VAP\*\*), *P. splendida*\* (VAP\*\*).

#### Family Bucephalidae Poche, 1907

31. *Bucephalus* sp. Pectoral fins of *C. synspilum*\* (ATA\*\*).

#### Family Cryptogonimidae Ward, 1917

32. *Oligogonotylus manteri* Watson, 1976. Intestinal wall, mesenteries, gills, pectoral, and pelvic fins of *C. urophthalmus* (CEL, CHA, GUE, LAG, MIT, NOB, VAP) (Scholz et al., 1994); *C. friedrichstahli* (CEA, CEN), *C. meeki* (CAB, CEA, CUA), *C. octofasciatum* (BOX, CAB), *C. synspilum* (CAB, CEA, FRA), *C. urophthalmus* (CAB, DZA, DZO, HOD) (Scholz et al., 1995c); *C. urophthalmus* CHL\*\*, GER\*\*, PAL\*\*, PAR\*\*.

33. Cryptogonimidae gen. sp. From *C. fenestratum*\* (ROS), *C. helleri*\* (VAP\*\*), *P. splendida*\* (SAN\*\*) (Fucugauchi et al., 1988).

#### Family Echinostomatidae Poche, 1926

34. *Drepanocephalus* sp. Scales of lateral line of *C. fenestratum* (CAT) (Jiménez-García, 1993); *C. geddesi*\* (VAP\*\*); *C. helleri* (VAP\*\*); *C. pearsei*\* (VAP\*\*), *C. synspilum*\* (VAP\*\*), *C. urophthalmus*\* (VAP\*\*).

35. *Echinochasmus leopoldinae* Scholz, Ditrach, and Vargas-Vázquez, 1996. Gills of *C. fenestratum* (CAT) (Jiménez-García, 1993); *C. urophthalmus* (CHE, DZO, HOD), *P. splendida* (NOC) (Scholz et al., 1995c); *C. synspilum* (HON), *C. urophthalmus* (CHE, DZO, HOD, MIT), *P. splendida* (NOC) (Scholz et al., 1996);

*C. geddesi*\* (VAP\*\*), *C. helleri*\* (VAP\*\*), *C. managuense*\* (VAP\*\*), *C. pearsei*\* (VAP\*\*), *C. robertsoni*\* (CAM\*\*), *C. synspilum* (ATA\*\*, VAP\*\*), *C. urophthalmus* (ATA\*\*, CEL\*\*, SAE\*\*, VAP\*\*), *P. splendida* (VAP\*\*). Remarks: These metacercariae were previously misidentified as *E. zubedakhaname* Nasir and Diaz, 1968 (Lamothe-Argumedo and Aguirre-Macedo, 1991a, b; Salgado-Maldonado, 1993; Jiménez-García, 1993) and reported as *Echinochasmus* sp. 1 (Scholz et al., 1995c). However, Scholz (pers. comm.) suggested *E. zubedakhaname* does not occur in Yucatán, Mexico.

#### Family Cathaemasiidae Fuhrmann, 1928

36. *Ribeiroia ondatrae* (Price, 1931). Scales of lateral line of *C. urophthalmus* (BAL, COR, GUA, JON, SPE, VAP), *C. geddesi* (VAP), *C. pearsei* (VAP), *C. synspilum* (VAP) (Aguirre-Macedo and García-Magaña, 1994); *C. synspilum* (SIL\*\*), *C. urophthalmus* (LAG\*\*, SIL\*\*, VAP), *P. splendida*\* (SIL\*\*).

#### Family Heterophyidae Odhner, 1914

37. *Ascocotyle (Phagicola) nana* Ramson, 1920. Fins, gills, eyes, muscles, mesenteries, swimbladder, spleen, heart, kidney, liver, intestinal wall, brain, and gonads of *C. urophthalmus* (CEL, LAG, USU) (Salgado-Maldonado and Aguirre-Macedo, 1991); *C. friedrichstahli* (CEA), *C. meeki* (CAB, CUA, NOC), *C. octofasciatum* (BOX, CAB), *C. synspilum* (CAB, CEA, FRA), *C. urophthalmus* (CAB, CHE, DZI, DZO, GRA, HOD, NOC) (Scholz et al., 1995c); *C. rectangularis*\* (TEN\*\*); *C. helleri*\* (VAP\*\*), *C. geddesi*\* (VAP\*\*), *C. managuense*\* (VAP\*\*), *C. pearsei*\* (VAP\*\*), *C. robertsoni*\* (CAM\*\*), *C. synspilum* (ATA\*\*, HOR\*\*, TUC\*\*, VAP\*\*), *C. urophthalmus* (ATA\*\*, BAL\*\*, CAM\*\*, CAY\*\*, GUA\*\*, HOR\*\*, MIT\*\*, SAE\*\*, SPE\*\*, TEA\*\*, TUC\*\*), *P. splendida*\* (VAP\*\*). Remarks: This species was previously identified as *Phagicola angrense* (Salgado-Maldonado and Aguirre-Macedo, 1991, but see Scholz et al., 1995c, who reported on this species as *A. (Phagicola) sp. 2*); present identification is due to Scholz (pers. comm.).

38. *Ascocotyle (Ascocotyle) sp.* Gills of *C. meeki* (CAB, CHK, CUA, NOC), *C. octofasciatum* (BOX), *C. urophthalmus* (NOC) (Scholz et al., 1995c). Remarks: Previously reported as *Ascocotyle (Phagicola) sp. 3* (Scholz et al., 1995c),

this species will be described elsewhere, Scholz (pers. comm.).

39. *Ascocotyle leighi* Burton, 1956. Gills, mesenteries, heart, and kidney of *C. helleri* (ROS) (Fucugauchi *et al.*, 1988); *C. geddesi*\* (VAP\*\*), *C. helleri* (ILU\*\*), *C. managuense*\* (VAP\*\*), *C. pearsei*\* (VAP\*\*), *C. synspilum*\* (ILU\*\*), *P. splendida*\* (VAP\*\*).

40. *Ascocotyle (Ascocotyle) tenuicollis* Price, 1935. Heart of *C. friedrichsthalii* (TUC), *C. geddesi* (VAP) (Aguirre-Macedo and García-Magaña, 1994); *C. octofasciatum* (CAB), *C. synspilum* (CEA, CAB) (Scholz *et al.*, 1995c); *C. pearsei*\* (VAP\*\*).

41. Heterophyidae gen. sp. Muscles of *C. meeki* (CHK) (Scholz *et al.*, 1995c).

#### Family Clinostomidae Lühe, 1901

42. *Clinostomum intermedialis* Lamont, 1920. Muscles of *C. urophthalmus* (SAN) (Pineda-López *et al.*, 1985).

43. *Clinostomum complanatum* (Rudolphi, 1814). Fins, operculum, gills, muscles, mesenteries, heart, liver, and gonads of *C. mojarra* (TUX) (Bravo-Hollis and Caballero Deloya, 1973); *C. istlanum* (INF) (Osorio-Sarabia, 1982b); *C. pearsei* (SAN), *C. synspilum* (JON, SAN), *C. urophthalmus* (SAN), *P. splendida* (JON, SAN, SPE) (Pineda-López, 1985b); *C. synspilum* (SAN, JON, SPE), *Cichlasoma* sp. (JON), *P. splendida* (SAN, JON, SPE) (Pineda-López, *et al.*, 1985); *C. urophthalmus* (ROS), *P. splendida* (ROS) (Fucugauchi *et al.*, 1988); *C. pasionis* (CHI), *P. splendida* (CHI) (Osorio-Sarabia *et al.*, 1987); *C. fenestratum* (CAT) (Jiménez-García, 1993); *C. urophthalmus* (CHE) (Scholz *et al.*, 1995c); *C. synspilum* (TUC), *Cichlasoma* sp. (TEN), *C. urophthalmus* (CEL, CHA, CHL, GER, JON, LAG, NOB, PAL, PAR, TEN, VAP) (Aguirre-Macedo and García-Magaña, 1994); *C. geddesi*\* (VAP\*\*), *C. helleri* (ILU\*\*), VAP\*\*), *C. pasionis* (ILU\*\*), *C. pearsei* (VAP\*\*), *C. robertsoni*\* (SIL\*\*), *C. synspilum* (VAP\*\*), *C. urophthalmus* (CAM\*\*, HOR\*\*, MIT\*\*, PAL\*\*, TUC\*\*), *P. splendida* (SIL\*\*, VAP\*\*).

#### Family Diplostomidae Poirier, 1886

44. *Diplostomum (Austrodiplostomum) compactum* (Lutz, 1928). Eye (humor body) and brain of *C. aureum* (TLA) (Caballero and Winter, 1954); *C. motaguense* (EMZ), *C. synspilum* (JON), *Cichlasoma* sp. (SPE), *P. splendida*

(JON, SPE) (Pineda-López, 1985b); *C. motaguense* (EMZ), *C. synspilum* (JON), *Cichlasoma* sp. (SPE), *P. splendida* (JON, SPE) (Pineda-López *et al.*, 1985); *C. grammodes* (LPA), *C. hartwegi* (LPA), *P. splendida* (LPA) (Pineda-López, 1985a); *C. meeki* (CHI, HOR), *C. urophthalmus* (CHI, HOR), *P. splendida* (CHI, HOR) (Osorio-Sarabia *et al.*, 1987); *C. meeki* (CUA, CEA, NOC), *C. synspilum* (CEA), *C. urophthalmus* (CHE, HOD) (Scholz *et al.*, 1995c); *C. geddesi*\* (TEN\*\*, VAP\*\*), *C. helleri* (HOR\*\*, ILU\*\*, TEA\*\*, VAP\*\*), *C. managuense* (VAP\*\*), *C. pasionis*\* (ILU\*\*), *C. pearsei*\* (VAP\*\*), *C. synspilum* (SIL\*\*, TUC\*\*, VAP\*\*), *C. urophthalmus* (CHL, GER\*\*, GUA\*\*, HOR\*\*, JON\*\*, MIT\*\*, NOB\*\*, SAN\*\*, SIL\*\*, SPE\*\*, TUC\*\*, VAP\*\*), *P. splendida* (MAL\*\*, SAN\*\*, SIL\*\*, VAP\*\*). Remarks: *D. spathaceum* of Caballero and Winter (1954) is *D. (A.) compactum* (Osorio-Sarabia *et al.*, 1987).

45. *Diplostomum spathaceum* (Rudolphi, 1819). Eye of *C. istlanum* (INF) (Osorio-Sarabia, 1982b).

46. *Diplostomum* sp. Muscles, mesenteries of *C. helleri* (ROS) (Fucugauchi *et al.*, 1988); *C. geddesi*\* (VAP\*\*), *C. helleri* (ROS, VAP\*\*), *C. pearsei*\* (VAP\*\*), *C. synspilum*\* (VAP\*\*), *C. urophthalmus* (CEL\*\*, VAP\*\*), *P. splendida*\* (SIL\*\*, VAP\*\*).

47. *Posthodiplostomum minimum* (MacCallum, 1921). Fins, gills, muscles, and mesenteries of *C. friedrichsthalii* (CEA), *C. meeki* (CHK), *C. octofasciatum* (BOX), *C. pearsei* (NOC), *C. urophthalmus* (CHE, DZO, GRA, HOD, ZAC) (Scholz *et al.*, 1995c); *C. urophthalmus* (CHA, CHL, GUA, MIT, NOB, PAR, VAP) (Aguirre-Macedo and García-Magaña, 1994); *C. urophthalmus* (CAY\*\*, CHA, GER\*\*, LAG\*\*, NOB, PAL\*\*, PAR, VAP).

48. *Posthodiplostomum* sp. Muscles, mesenteries, spleen, liver, brain, and kidney of *C. pearsei* (SAN), *C. synspilum* (JON, SAN, SPE), *C. urophthalmus* (SAN), *P. splendida* (JON, SAN, SPE) (Pineda-López, 1985b); *C. hartwegi* (LPA) (Pineda-López, 1985a); *C. pasionis* (HOR) (Osorio-Sarabia *et al.*, 1987); *C. helleri* (ROS) (Fucugauchi *et al.*, 1988); *C. fenestratum* (CAT) (Jiménez-García, 1993); *C. octofasciatum* (BOX), *C. pearsei* (NOC), *C. urophthalmus* (DZO, HOD) (Scholz *et al.*, 1995c); *C. helleri* (VAP), *Cichlasoma* sp. (TEN) (Aguirre-Macedo and García-Magaña, 1994); *C. friedrichsthalii*\*

(TUC\*\*), *C. geddesi*\* (ROS\*\*, TUC\*\*, VAP\*\*), *C. helleri*\* (ILU\*\*, TUC\*\*), *C. managuense*\* (SIL\*\*, VAP\*\*), *C. pasionis* (ILU\*\*), *C. pearsei* (VAP\*\*), *C. robertsoni*\* (SIL\*\*), *C. synspilum* (ATA\*\*, ILU\*\*, SIL\*\*, TUC\*\*, VAP\*\*), *C. urophthalmus*\* (CAY\*\*, GER\*\*, MIT\*\*, SIL\*\*, TUC\*\*, VAP\*\*), *P. splendida* (JON, ROS, SAN, SIL\*\*, SPE, TUC\*\*, VAP\*\*).

#### Family Proterodiplostomidae Dubois, 1936

49. Proterodiplostomidae gen. sp. Gills, swim-bladder, and gonads of *C. synspilum* (ROS) (Fucugauchi *et al.*, 1988); *C. octofasciatum* (BOX) (Scholz *et al.*, 1995c); *C. synspilum* (ROS).

#### Family Strigeidae Railliet, 1919

50. Strigeidae gen. sp. Mesenteries of *C. synspilum*\* (VAP\*\*), *P. splendida*\* (VAP\*\*).

51. Tetracotyle. Opercula, gills, mesenteries, liver, and intestine of *C. mayorum* (XOL) (Mantel, 1936); *C. meeki* (CHI), *P. splendida* (CHI) (Osorio-Sarabia *et al.*, 1987); *C. helleri* (TEA); *C. synspilum* (TUC), *C. urophthalmus* (CHO, ESP) (Aguirre-Macedo and Garcia-Magaña, 1994); *C. geddesi*\* (VAP\*\*), *C. helleri* (TUC\*\*), *C. pearsei*\* (VAP\*\*), *C. synspilum* (VAP\*\*). Remarks: Probably, this is a species of *Apharyngostrigea* (see Scholz *et al.*, 1995c).

#### Adult Cestoda

##### Family Bothriocephalidae Blanchard, 1849

52. *Bothriocephalus acheilognathi* Yamaguti, 1934. Intestine of *C. istlanum* (INF) (Osorio-Sarabia, 1982b); *C. urophthalmus*\* (JON\*\*, CEL\*\*).

#### Larval Cestoda

##### Order Trypanorhyncha Diesing, 1863

53. Trypanorhyncha gen. sp. Lumen of intestine of *C. managuense*\* (VAP\*\*), *C. urophthalmus*\* (CEL\*\*).

##### Order Tetraphyllidea Carus, 1863

54. Tetraphyllidea gen. sp. Lumen of intestine of *C. urophthalmus*\* (CAY\*\*, CEL\*\*, CHA\*\*, CHL\*\*, GER\*\*, PAL\*\*, PAR\*\*, VAP\*\*).

##### Order Proteocephalidea Mola, 1928

55. Proteocephalidea gen. sp. Mesenteries and intestine of *C. synspilum* (ROS), *P. splendida* (ROS) (Fucugauchi *et al.*, 1988); *C. geddesi*

(SAN), *C. managuense* (JON), *C. rectangulare* (JON, EMZ, SAN), *C. synspilum* (SAN), *C. urophthalmus* (EMZ), *P. splendida* (EMZ, SPE) (Pineda-López *et al.*, 1985); *C. managuense* (VAP\*\*), *C. pasionis*\* (TUC\*\*), *C. robertsoni*\* (SIL\*\*), *C. synspilum* (SIL\*\*, TUC\*\*, VAP\*\*), *C. urophthalmus* (CEL\*\*, CHL\*\*, MIT\*\*, TUC\*\*, VAP\*\*), *P. splendida* (SIL\*\*, VAP\*\*).

#### Adult Acanthocephala

##### Family Echinorhynchidae Cobbold, 1876

56. *Acanthocephalus dirus* (Van Cleave, 1931). Intestine of *C. urophthalmus* (CHA\*\*).

##### Family Illiosentidae Golvan, 1960

57. *Dollfusentis chandleri* Golvan, 1969. Intestine of *C. urophthalmus*\* (CHA\*\*).

##### Family Neoechinorhynchidae Ward, 1917

58. *Floridosentis mugilis* (Machado, 1951). Intestine of *C. istlanum* (INF) (Osorio-Sarabia, 1982b).

59. *Neoechinorhynchus golvani* Salgado-Maldonado, 1978. Intestine of *C. aureum* (CAT) (Salgado-Maldonado, 1978); *C. geddesi* (SAN), *C. managuense* (EMZ), *C. pearsei* (SAN), *C. rectangulare* (SAN), *C. synspilum* (SAN), *C. urophthalmus* (EMZ, SAN), *P. splendida* (EMZ) (Pineda-López *et al.*, 1985); *C. fenestratum* (CHI, VIG, SPE, ESP), *C. meeki* (CHI, VIG, SPE, ESP), *C. pasionis* (CHI, VIG, SPE, ESP), *C. pearsei* (CHI, VIG, SPE, ESP), *C. rectangulare* (CHI, VIG, SPE, ESP), *C. urophthalmus* (CHI, VIG, SPE, ESP), *P. splendida* (CHI, VIG, SPE, ESP) (Salgado-Maldonado, 1985); *C. meeki* (CHI, HOR), *C. pasionis* (CHI), *C. urophthalmus* (CHI, HOR), *Cichlasoma* sp. (CHI, HOR), *P. splendida* (CHI, HOR) (Osorio-Sarabia *et al.*, 1987); *C. helleri* (ROS), *C. synspilum* (ROS) (Fucugauchi *et al.*, 1988); *C. fenestratum* (CAT) (Jiménez-García, 1993); *C. urophthalmus* (CHE) (Scholz *et al.*, 1996); *C. friedrichstahli*\* (TUC\*\*), *C. geddesi* (TUC\*\*, VAP\*\*), *C. helleri* (ILU\*\*), *C. managuense* (GUA\*\*, SIL\*\*, VAP\*\*), *C. pasionis* (ILU\*\*, TUC\*\*), *C. pearsei* (VAP\*\*), *C. rectangulare* (SIL\*\*), *C. robertsoni*\* (SIL\*\*), *C. synspilum* (ATA\*\*, ILU\*\*, TUC\*\*, VAP\*\*), *C. urophthalmus* (ATA\*\*, CAY\*\*, CEL\*\*, CHA\*\*, GUA\*\*, GER\*\*, PAL\*\*, SAE\*\*, SIL\*\*, TUC\*\*, VAP\*\*), *P. splendida* (SAN\*\*, SIL\*\*, VAP\*\*).

60. *Octosporiferoides chandleri* Bullock, 1957.

Intestine of *C. friedrichstahli* (CEN) (Scholz *et al.*, 1996).

### Larval Acanthocephala, Cystacanths

#### Family Polymorphidae Meyer, 1931

61. *Polymorphus brevis* (Van Cleave, 1916). Intestinal wall of *C. synspilum* (CUA) (Scholz *et al.*, 1996).

62. *P. mutabilis* (Rudolphi, 1819). Mesenteries and kidney of *C. urophthalmus* (CHI), *P. splendida* (CHI) (Osorio-Sarabia *et al.*, 1987); *C. fenestratum* (CAT) (Jiménez-García, 1993); *C. friedrichstahli*\* (TUC\*\*), *C. geddesi*\* (VAP\*\*), *C. managuense*\* (VAP\*\*), *C. pasionis*\* (TUC\*\*), *C. pearsei*\* (VAP\*\*), *C. synspilum*\* (ATA\*\*, VAP\*\*), *C. urophthalmus* (ATA\*\*, CAY\*\*, CEL\*\*, CHL\*\*, HOR, LAG\*\*, MIT\*\*, NOB\*\*, PAL\*\*), *P. splendida* (SAN\*\*, TUC\*\*). Remarks: Polymorphid cystacanths of Osorio-Sarabia *et al.* (1987) are *P. mutabilis*.

### Adult Nematoda

#### Family Capillariidae Railliet, 1915

63. *Capillaria* (*Hepatocapillaria*) *cichlasomae* Moravec, Scholz, and Mendoza-Franco, 1995. Intestine of *C. urophthalmus* (XPO) (Moravec *et al.*, 1995b).

#### Family Pharyngodonidae Travassos, 1919

64. *Laurotravassoxyuris bravoae* Osorio-Sarabia, 1984. Intestine of *C. istlanum* (INF) (Osorio-Sarabia, 1984).

#### Family Cosmocercidae (Railliet, 1916)

65. *Raillietinema kritscheri* Moravec, Salgado-Maldonado, and Pineda-López, 1993. Posterior intestine of *C. pearsei* (CHN, EMZ, SPE, VAP), *C. synspilum* (VAP), *C. urophthalmus* (LAG, VAP) (Moravec *et al.*, 1993). Remarks: Cited in Pineda-López *et al.* (1985) as *Oxyuroidea*.

#### Family Cucullanidae Cobbold, 1864

66. *Cucullanus* sp. Intestine of *C. synspilum*\* (SAN\*\*).

#### Family Anisakidae Railliet and Henry, 1912

67. *Goezia nonipapillata* Osorio-Sarabia, 1982. Intestine of *C. istlanum* (INF), (Osorio-Sarabia, 1982a).

68. *Goezia* sp. Intestine of *C. hartwegi* (ANG) (Pineda-López *et al.*, 1985); *C. geddesi*\* (VAP\*\*), *C. pearsei*\* (VAP\*\*), *C. synspilum*\*

(VAP\*\*), *C. urophthalmus*\* (VAP\*\*, HOR\*\*), *P. splendida*\* (VAP\*\*).

#### Family Camallanidae Railliet and Henry, 1915

69. *Procamallanus* (*Spirocamallanus*) *rebecae* Andrade-Salas, Pineda-López, and García-Magaña, 1994. Intestine of *C. rectangulare* (EMZ), *C. synspilum* (SAN), *Cichlasoma* sp. (SPE), *P. splendida* (JON) (Pineda-López *et al.*, 1985); *C. meeki* (CHI), *C. pasionis* (CHI), *P. splendida* (CHI) (Osorio-Sarabia *et al.*, 1987); *C. geddesi* (ROS), *C. helleri* (ROS), *C. synspilum* (ROS), *C. urophthalmus* (ROS), *Cichlasoma* sp. (ROS), *P. splendida* (ROS) (Fucugauchi *et al.*, 1988); *C. synspilum* (ILU) (Andrade-Salas *et al.*, 1994); *C. meeki* (CEA, CAB), *C. synspilum* (CEA), *C. urophthalmus* (CHE, CAB) (Moravec *et al.*, 1995a, c); *C. geddesi* (TUC\*\*, VAP\*\*), *C. helleri* (HOR\*\*, ILU\*\*, TUC\*\*, VAP\*\*), *C. managuense*\* (GUA\*\*, SIL\*\*, VAP\*\*), *C. pasionis* (ILU\*\*, TUC\*\*), *C. rectangulare*\* (SIL\*\*), *C. robertsoni*\* (SIL\*\*), *C. synspilum* (SIL\*\*, TUC\*\*, VAP\*\*), *C. urophthalmus* (HOR\*\*, GER\*\*, GUA\*\*, GUE\*\*, MIT\*\*, NOB\*\*, SIL\*\*, TUC\*\*, VAP\*\*), *P. splendida* (SAN\*\*, SIL\*\*, VAP\*\*). Remarks: *S. pereirai* of Pineda-López *et al.* (1985b) and of Osorio-Sarabia *et al.* (1987) is *P. (S.) rebecae*.

#### Family Daniconematidae Moravec and Køie, 1987

70. *Mexiconema cichlasomae* Moravec, Vidal, and Salgado-Maldonado, 1992. Skin beneath scales, abdominal cavity, mesenteries, swim-bladder, liver, spleen, kidney, intestinal lumen, and serous membrane covering intestine of *C. helleri* (HOR, VAP), *C. managuense* (VAP), *C. pearsei* (VAP), *C. urophthalmus* (CAY, CEL, CHA, CHL, GER, LAG, NOB, PAL, PAR, VAP) (Moravec *et al.*, 1992).

#### Family Rhabdochoniidae Travassos, Artigas, and Pereira, 1928

71. *Rhabdochona kidderi* Pearse, 1936. Intestine of *C. managuense* (EMZ, JON), *C. urophthalmus* (JON, SAN), *Cichlasoma* sp. (SPE) (Pineda-López *et al.*, 1985); *C. helleri* (ROS) (Fucugauchi *et al.*, 1988); *C. fenestratum* (CAT) (Jiménez-García, 1993); *C. helleri* (ILU\*\*), *C. synspilum*\* (VAP\*\*).



**Family Cystidicolidae Skrjabin, 1946**

72. *Spinitectus* sp. Intestine of *C. fenestratum* (ROS), *P. splendida* (ROS) (Fucugauchi *et al.*, 1988).

**Larval Nematodes****Family Kathlaniidae Lane, 1914**

73. *Falcaustra* sp. Abdominal cavity (mainly surface of intestine), liver, gallbladder, mesenteries, and brain (free or encysted) of *C. meeki* (NOC), *C. octofasciatum* (BOX), *C. urophthalmus* (CHE, DZO, HOD), *P. splendida* (NOC) (Moravec *et al.*, 1995d).

**Family Anisakidae Railliet and Henry, 1912**

74. *Raphidascaris* sp. Intestine of *C. managuense* (EMZ) (Pineda-López *et al.*, 1985).

75. *Thynnascaris habena* Lutton, 1900. Intestine of *C. istlanum* (INF) (Osorio-Sarabia, 1982b). Remarks: the genus *Thynnascaris* is a partial synonym of *Hysterothylacium*.

76. *Contraecaecum multipapillatum* (Von Drasche, 1882). Mesenteries of *C. istlanum* (INF) (Osorio-Sarabia, 1982b); *C. synspilum*\* (ATA\*\*, SIL\*\*), *C. urophthalmus*\* (CAM\*\*, CEL\*\*, LAG\*\*, MIT\*\*). Remarks: Osorio-Sarabia (1982b) described *C. robustum* from cichlids of Infiernillo, Michoacan; however, Dardorff and Overstreet (1980) pointed out that *C. robustum* is a junior synonym of *C. multipapillatum*.

77. *Contraecaecum* sp. Mesenteries, liver, gonads, and intestinal wall of *C. mayorum* (XOL) (Pearse, 1936); *C. baeni* (INF) (Osorio-Sarabia, 1982b); *C. managuense* (EMZ, JON), *C. rectangularis* (EMZ); *C. urophthalmus* (EMZ, JON, SAN), *P. splendida* (EMZ, JON, SPE) (Pineda-López *et al.*, 1985); *C. hartwegi* (ANG), *C. passionis* (CHI), *C. urophthalmus* (CHI), *P. splendida* (CHI) (Osorio-Sarabia *et al.*, 1987); *P. splendida* (ROS) (Fucugauchi *et al.*, 1988); *C. synspilum* (CAB), *C. urophthalmus* (CAB, CHE, DZO, HOD, NOC) (Moravec *et al.*, 1995d); *C. geddesi*\* (VAP\*\*), *C. helleri*\* (ILU\*\*, VAP\*\*), *C. managuense* (SIL\*\*, VAP\*\*), *C. pearsei*\* (VAP\*\*), *C. synspilum* (CEA\*\*, SAN\*\*, SIL\*\*), *C. urophthalmus* (CEL\*\*, CHA\*\*, CHL, GER\*\*, LAG\*\*, NOB\*\*, PAL\*\*, PAR\*\*, SAE\*\*, SIL\*\*, VAP\*\*), *P. splendida* (VAP\*\*). Remarks: Moravec *et al.* (1995b) differentiate 2 *Contraecaecum* type larvae; adults of Type 2 larvae may belong to the group of spe-

cies of *C. microcephallum* (Rud., 1819), *C. multipapillatum* (von Drasche, 1882), *C. micropapillatum* (Stossich, 1890), *C. caballeroi* (Bravo Hollis, 1939), *C. plagiaticum* (Lent and Freitas, 1948) among others, parasitizing mainly fish-eating birds. Adult *Contraecaecum* of 2 species, *C. multipapillatum* and *C. spinigerum*, have been already identified in the same single bird in some localities in southern México (Amaya-Huerta, 1991; Vidal-Martínez *et al.*, 1994).

**Family Gnathostomatidae Railliet, 1895**

78. *Gnathostoma binucleatum* Almeyda-Artigas, 1991. Muscle of *C. fenestratum* (TEM), *C. urophthalmus* (TEM), *P. splendida* (TEM), Almeyda-Artigas (1991).

79. *Gnathostoma* sp. Muscles of *C. gadovii* (TEM), *C. urophthalmus* (TEM), *P. splendida* (TEM) (Lamothe-Argumedo *et al.*, 1989).

80. *Spiroxys* sp. Mesenteries of *C. managuense* (JON), *C. urophthalmus* (SAN) (Pineda-López *et al.*, 1985); *C. meeki* (CHI), *C. passionis* (CHI) (Osorio-Sarabia *et al.*, 1987); *C. meeki* (NOC), *C. urophthalmus* (CHE) (Moravec *et al.*, 1995d); *C. managuense* (SIL\*\*), *C. pearsei*\* (VAP\*\*), *C. synspilum* (SIL\*\*, VAP\*\*), *C. urophthalmus* (GER\*\*, LAG\*\*, MIT\*\*, NOB\*\*, SIL\*\*, VAP\*\*).

81. Ascaridae gen. sp. Muscles of *C. managuense* (EMZ) (Pineda-López *et al.*, 1985).

**Family Camallanidae Railliet and Henry, 1915**

82. *Camallanus* sp. Intestine of *C. meeki* (CHI, HOR), *Cichlasoma* sp. (CHI, HOR), *P. splendida* (CHI, HOR) (Osorio-Sarabia *et al.*, 1987); *C. urophthalmus*\* (HOR\*\*). Remarks: Larvae of *C. lacustris* of Osorio-Sarabia *et al.* (1987) are a misidentification.

83. *Procamallanus* (*Spirocamallanus*) *rebecae* Andrade-Salas, Pineda-López, and García-Magaña, 1994. Intestine of *C. meeki* (CHI), *C. passionis* (CHI) (Osorio-Sarabia *et al.*, 1987); *C. gadovii*\* (RIO\*\*), *C. synspilum* (VAP\*\*), *C. urophthalmus*\* (HOR\*\*, VAP\*\*), *P. splendida*\* (SAN\*\*). Remarks: Moravec *et al.* (1995a) identified larvae previously reported as *Procamallanus* sp. by Osorio-Sarabia *et al.* (1987) as the third-stage larvae of *P. (S.) rebecae*.

84. Camallanidae gen. sp. Intestine of *C. geddesi* (VAP\*\*), *C. helleri* (VAP\*\*), *C. motguense* (VAP\*\*), *C. synspilum* (VAP\*\*), *C. urophthalmus* (VAP\*\*).

**Family Acuariidae Railliet, Henry and Sisoff, 1912**

85. Acuariidae gen. sp. Mesentery of *C. urophthalmus* (CHE) (Moravec *et al.*, 1995d).

**Hirudinea****Family Piscicolidae Johnson, 1865**

86. *Myzobdella patzcuarensis* (Caballero, 1941). Site of infection? *Petenia splendida* (YUC), (Moore, 1936, in Ringuélet, 1982).

87. *Myzobdella* sp. Body surface, fins, opercula, and mouth of *C. geddesi* (SAN), *C. pearsei* (SAN), *C. rectangulare* (SAN), *C. synspilum* (JON, SAN), *P. splendida* (JON, SPE) (Pineda-López *et al.*, 1985); *P. splendida* (CHI) (Osorio-Sarabia *et al.*, 1987); *C. helleri* (ROS), *P. splendida* (ROS) (Fucugauchi *et al.*, 1988); *C. geddesi* (VAP\*\*), *C. helleri*\* (VAP\*\*), *C. motaguense*\* (VAP\*\*), *C. pearsei* (VAP\*\*), *C. synspilum* (TUC, VAP\*\*), *C. urophthalmus*\* (HOR\*\*, VAP\*\*), *P. splendida* (SAN\*\*, VAP\*\*).

**Mollusca, Larvae**

88. *Proptera alata* (Say, 1817). Body surface, fins, and gills of *C. friedrichstahli*\* (TUC\*\*), *C. geddesi*\* (TUC\*\*), *C. helleri*\* (ROS\*\*, TUC\*\*), *C. pasionis*\* (TUC\*\*), *C. synspilum*\* (TUC\*\*), *C. urophthalmus*\* (TUC\*\*), *P. splendida*\* (TUC\*\*).

**Arthropoda, Pentastomida, Larvae**

89. *Subtriquetra subtriquetra* Sambon, 1922. Mesenteries of *C. synspilum*\* (VAP\*\*), *C. urophthalmus*\* (VAP\*\*).

90. *Sebekia* sp. Mesenteries of *C. motaguense* (SPE) (Pineda-López and García-Magaña, 1991).

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## 1997–1998 Meeting Schedule

- 22 October 1997 Naval Medical Research Institute (NMRI), Bethesda, MD (Contact person: Kevin Baird, 301-295-1650)
- 19 November 1997 Anniversary Dinner–Meeting, Location TBA
- 21 January 1998 Johns Hopkins University, Montgomery County Center (Contact person: Thomas Simpson, 410-366-8814 or 757-787-7689)
- 8 March 1998 Nematology Laboratory, BARC-West, Beltsville, MD (Contact person: David Chitwood, 301-504-8634)
- 9 May 1998 University of Pennsylvania, New Bolton Center, Kennett Square, PA (Contact person: Phillip Scott, 215-898-1602)